



Docket No.: WEB-19967

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MAIL STOP: APPEAL BRIEF-PATENTS

By: Loren D. Pearson Date: January 30, 2006

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

Applic. No. : 09/768,394 Confirmation No.: 1357
Inventors : Franz Haas et al.
Filed : January 24, 2001
Title : Use of Erythritol and /or Xylitol in
Baking Mixtures or Doughs for Non-
Perishable Goods Made from Flours and/or
Starches as Partial or Complete Sugar
Replacement
TC/A.U. : 1761
Examiner : Leslie Wong
Customer No. : 24131

Hon. Commissioner for Patents
Alexandria, VA 22313-1450

BRIEF ON APPEAL

Honorable Board:

This is an appeal from the final rejection in the Office
action dated May 27, 2005, finally rejecting claims 36-59.

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Appellants submit this *Brief on Appeal* in triplicate, including payment in the amount of \$500.00 to cover the fee for filing the *Brief on Appeal*.

Real Party in Interest:

This application is assigned to Franz Haas Waffelmaschinen-Industrie Akteingesellschaft. The assignment will be submitted for recordation upon the termination of this appeal.

Related Appeals and Interferences:

No related appeals or interference proceedings are currently pending which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Status of Claims:

Claims 36-59 are rejected and are under appeal. Claims 1-35 were cancelled in an Amendment filed on March 8, 2005 in the U.S. Patent Office.

Status of Amendments:

No claims were amended after the final Office Action. A *Notice of Appeal* was filed on November 30, 2005.

Summary of the Claimed Subject Matter:

As stated in the first paragraph on page 1 of the specification of the instant application, the invention relates to the production of wafers that have been substantially baked dry and are therefore crispy and brittle (flat wafers, hollow wafers, cones and cups, wafer biscuits, rolled wafers, fantasy shapes etc.) or other non-perishable goods, for instance wafer rolls, is performed by methods that have long been known in which a flowable baking mixture, also including viscous to solid dough, is baked using heated baking molds within a very short time of less than 1 to 3 minutes to a residual water content so low that the known brittle texture results.

Appellants explained on page 8 of the specification, line 2, that, it is accordingly an object of the invention to provide a baking mixture such as batter dough for baking heat-deformable non-perishable baked goods characterized by a diminished level of sweet taste made from flours and/or starches, that overcomes the above-mentioned disadvantages of the prior art methods and mixtures of this general type.

Appellants stated on page 8 of the specification, line 10, that, it is a further object of the invention to provide non-perishable baked goods made from flours and/or starches,

shaped in a plastic state at an elevated temperature and characterized by a diminished level of sweet taste and a crispy and brittle texture at ambient temperature, that overcomes the above-mentioned disadvantages of the prior art methods and mixtures of this general type.

Appellants explained on page 8 of the specification, line 18, that, it is a further object of the invention to provide a method of producing non-perishable baked goods made from flours and/or starches, shaped in a plastic state at an elevated temperature and characterized by a diminished level of sweet taste and a crispy and brittle texture at ambient temperature that overcomes the above-mentioned disadvantages of the prior art methods and mixtures of this general type.

Appellants stated on page 9 of the specification, line 18, that, with the foregoing and other objects in view, surprisingly, it has now been found in accordance with this invention that polyols having four to five carbon atoms and an alcoholic hydroxyl group linked to each carbon atom, in particular erythritol, xylitol, and mixtures thereof, are extremely efficient plasticizers for heat-deformable baked goods having a crispy and brittle texture at ambient temperature. Accordingly, the proportion of the functional plasticizer "sugar(s)" in wafers which can be reshaped in the

still hot state or in the state in which they are replasticized by reheating can be partially or completely replaced, and also significantly reduced, frequently to less than 50% by weight, by using an effective plasticizing amount of at least one polyol having four to five carbon atoms and an alcoholic hydroxyl group on each carbon atom, in particular erythritol, xylitol, and mixtures thereof.

Appellants stated on page 9 of the specification, line 18, that, when partially replacing sugar, the effective plasticizing amount of the polyol is at least 1% by weight of the total quantity of flours and starches and can range up to about 60% by weight of the total quantity of flours and starches. Preferably, the effective plasticizing amount of the polyol is 1 part by weight for each 2-3 parts by weight of sugar being replaced. Hence, the quantity of sugar remaining when sugar is partially replaced by polyol according to the invention can range up to 67% by weight of the total quantity of flours and starches.

Appellants explained on page 10 of the specification, line 4, that, when entirely replacing sugar, the effective plasticizing amount of the polyol according to the invention is in the range from 12% to 55% by weight of the total

quantity of flours and starches, preferably from 13% to 50% by weight on the same basis.

Appellants explained on page 10 of the specification, line 10, that, this is all the more remarkable, since corresponding experiments with another polyol, glycerol, which has three carbon atoms and three alcoholic hydroxyl groups, is known as an efficient plasticizer in the field of producing thermoplastic starches and is therefore obvious, were not successful here. Using glycerol, a similar wafer piece cannot be obtained. Only relatively thin wafers can be baked at all, with, moreover, bubble formation and the occurrence of light spots in the product and a significant tendency to sticking being observed.

Appellants stated on page 10 of the specification, line 21, that, in addition, it is all the more surprising, since, for instance, sorbitol, a polyol having six carbon atoms and six hydroxyl groups, cannot be used as a sugar substitute in such baked goods since it does not show this strong plasticizing action.

Appellants stated on page 11 of the specification, line 1, that, throughout the disclosure and claims of the invention, "sugar" is defined to mean all sugars previously used in wafer

production, such as sucrose, other sugars (i.e. monosaccharides and disaccharides), and the sugar components of syrups such as starch syrups, glucose syrups, fructose syrups, molasses syrups, as well as invert sugar and honey.

Appellants explained on page 11 of the specification, line 8, that, throughout the disclosure and claims of the invention, percent levels of ingredients are calculated as parts by weight of the ingredient per 100 parts of flours and starches combined.

Appellants stated on page 11 of the specification, line 13, that, erythritol, 1,2,3,4-tetrahydroxybutane, melting range 120°C - 126°C, is a white crystalline powder, readily soluble in water. Its occurrence in fruits, mushrooms and yeasts is known. Erythritol is currently preferably produced by fermentation from starch. Erythritol, compared with sucrose, has an only moderate sweet taste, approximately 65% by weight sweetness intensity as 10% strength by weight solution, and even less in the solid state as in non-perishable baked goods. The highly negative heat of solution causes a pleasantly cool taste impression in the mouth.

Appellants also explained on page 11 of the specification, line 24, that, erythritol has already been permitted as a food

in Japan, and in other countries this is to be expected. This polyol has only a low utilizable energy content for humans, about 10% by weight compared with sucrose. Erythritol is suitable for diabetics, is noncariogenic, is nonhygroscopic and has virtually no laxative effect.

Appellants also stated on page 12 of the specification, line 5, that, xylitol, 1,2,3,4,5-pentahydroxypentane, CAS 87-99-0, melting range 92°C - 96°C, is a white crystalline powder, readily soluble in water. It is found in fruits and vegetables. Xylitol tastes sweet, with a similar intensity to sucrose, and due to its highly negative heat of solution, causes a pleasantly cool taste impression in the mouth.

Appellants also explained on page 12 of the specification, line 12, that, xylitol is generally permitted as a sweetener in foods, and no ADI value is specified for limiting the acceptable daily intake. Only for higher concentrations must a warning be declared against potentially laxative effect. In addition, xylitol has noncariogenic effect and anticariogenic effect and is therefore currently widely used in sugar-free sweets and chewing gums.

Appellants also stated on page 12 of the specification, line 20, that, accordingly, there is provided according to this

invention, a baking mixture for baking non-perishable baked goods made from flours and/or starches, which are deformable at an elevated temperature and are characterized by a brittle and crispy texture at room temperature and a diminished level of sweetness, comprising, in weight per cent of the total quantity of flour and starch,

70-150% of water,

0-67% of a sugar,

and an effective plasticizing amount of at least one aliphatic polyol having four to five carbon atoms and an alcoholic hydroxyl group linked to each carbon atom.

Appellants also explained on page 13 of the specification, line 10, that, also in accordance with this invention, there are provided non-perishable baked goods made from flours and/or starches, which are deformable at an elevated temperature and characterized by a brittle and crispy texture at room temperature and a diminished level of sweetness, comprising, in weight per cent of the quantity of flour or starch, whichever is greater:

Maximum 10% of water, preferably less than 3%;

0-67% of a sugar, and

an effective plasticizing amount of at least one aliphatic polyol having four to five carbon atoms and an alcoholic hydroxyl group linked to each carbon atom.

Appellants also stated on page 14 of the specification, line 1, that, there is also provided, in accordance with this invention, a method of producing non-perishable baked goods made from flours and/or starches, which are deformable at an elevated temperature and characterized by a brittle and crispy texture at room temperature and a diminished level of sweetness.

Appellants also explained on page 14 of the specification, line 8, that, mixing water with aliphatic polyol having four to five carbon atoms and an alcoholic hydroxyl group on each carbon atom, sugar, and other minor components (for example salt, baking powder, emulsifiers, fat, and nutrient supplements) when present, and flour and/or starch, creates a baking mixture.

Appellants also taught, on page 14 of the specification, line 15, to meter the baking mixture into a heated baking vessel and baking to a residual water content of a few percent by weight, preferably less than 3% by weight. The baking temperature is in the range from 140°C to 230°C and the baking time, depending on product and baking temperature, is generally between 40 seconds and 3 minutes.

Appellants describe a method on page 14 of the specification, line 22, that includes removing the hot baked product from the baking vessel while still hot or when reheated after an intervening cooling stage; shaping the product by wrapping, rolling, deep-drawing, pressing, embossing, stamping, bending, or folding; and fixing the shape by cooling to solidify the plasticizing polyol and sugar when present.

Appellants also stated on page 15 of the specification, line 4, that, the surprisingly strong plasticizing action of erythritol and/or xylitol, in the case of complete replacement of sugar(s), is accompanied by a reduction in the required amount used to about half to one third of the sugar otherwise required.

Appellants also stated on page 15 of the specification, line 10, that, the highly efficient plasticizing action of the polyols according to the invention can be used for complete or partial replacement of sucrose and other sugars such that 1 part by weight of polyol can replace at least 2 and up to 3 parts by weight of sugar. Below approximately 0.5% by weight of polyol (calculated on the sum of flours and starches), its use is of little expedience, since at this level only approximately from 1 to 1.5% by weight of sugar can be replaced. Meaningful benefits of replacing sugar by polyol

according to the invention are observed at polyol levels of 1% by weight of polyol (based on the total of flour and starch) replacing 2-3% of sugar. The upper concentration of polyol according to the invention, in many applications, for instance rolling of cones, rolled wafers or wafer rolls is limited to an extent, which is generally below the ranges now common for sugar (see the exemplary embodiments). For other deformation processes, for instance deep-drawing such flour/starch-based edible products, however, even higher concentrations can be used.

Appellants also stated on page 16 of the specification, line 4, that, for complete sugar replacement, according to the invention, the proportion of erythritol and/or xylitol, based on flour and/or starch, is from 12 to 55% by weight, preferably from 13 to 50% by weight.

Appellants also explained on page 16 of the specification, line 9, that, this proportion, in baking mixtures such as batters or doughs, which are destined for the production of wafer rolls is from 20 to 55% by weight, preferably from 22 to 55% by weight, in particular from 25 to 50% by weight; which are destined for the production of rolled wafer cones is from 12 to 30% by weight, preferably from 13 to 25% by weight; which are destined for the production of rolled wafers is from

12 to 55% by weight, preferably from 14 to 35% by weight, in particular from 15 to 30% by weight; and which are destined for the production of deep-drawn shaped bodies is from 15 to 55% by weight, preferably from 16 to 40% by weight, in particular from 18 to 35% by weight.

Appellants also stated on page 17 of the specification, line 1, that, the production of reshapeable wafers or wafer rolls from sugar-containing baking mixtures is known technology using the following underlying data, which is also used in reshapeable products produced with partial or complete replacement by erythritol and/or xylitol.

Appellants also explained on page 17 of the specification, line 7, that the main raw materials include the following. Water, flour and/or starches and sugar are the main raw materials. In addition to, or instead of, wheat flour, other flours and/or starches can also be used.

Appellants also stated on page 17 of the specification, line 13, that, in addition to, or instead of, sucrose, other sugars (monosaccharides, disaccharides) and components of syrups (starch syrups, glucose syrups, fructose syrups, molasses syrups, invert sugar, honey) can also be used in conjunction.

Appellants further explained on page 17 of the specification, line 18, that it is possible to mix sugar, sugars and syrups and other minor components (for example salt, baking powder, emulsifiers, fat, nutrient supplements...) that are firstly dissolved or dispersed in water. The flour is then added and the whole is prepared to form a homogeneous suspension of flour in a solution of the sugar(s).

Appellants further stated on page 18 of the specification, line 1, that, the baking mixture is metered into heated, divided baking molds or heated drums (wafer rolls) and baked at temperatures between 140°C and 230°C to a residual water content of a few percent by weight, preferably less than 3% by weight. The baking time, depending on product and baking temperature, is generally between 40 seconds and 3 minutes.

Appellants further explained on page 18 of the specification, line 9, that, with respect to demolding and reshaping, the hot baked product leaves the baking mold as a planar endless belt (wafer rolls) or as a planar piece and is immediately, in a molding tool, in the still hot state, or at any rate in the reheated state, brought into a shape for instance by wrapping, rolling, deep-drawing, pressing, embossing, stamping, bending, folding, which shape is fixed on a subsequent short cooling section by solidifying the plasticizing sugar content, if

plastic deformability is not caused again by becoming moist or more intense heating.

Appellants further stated on page 18 of the specification, line 20, that, the surprisingly strong plasticizing action of erythritol and/or xylitol, in the case of complete replacement of sugar(s), is accompanied by a reduction in the required amount used to about half to one third of the sugar otherwise required.

Appellants also stated on page 19 of the specification, line 1, that, currently, it can only be assumed that these polyols are particularly efficient plasticizers for starch and protein. This may also be assumed because the viscosity of the baking mixtures does not increase, but even shows a slight tendency to decrease, despite the replacement of sugar by erythritol or xylitol concentrations that are lower by a factor of 2-3. Baking mixtures having a sucrose content reduced in such a manner, in contrast, are more highly viscous.

Appellants further stated on page 19 of the specification, line 10, that, in the case of erythritol as a sugar substitute, the reduced amount used is associated with complete disappearance of the sweet taste, and in the case of

xylitol with a very strong reduction. Only partial replacement of sugar(s) with a correspondingly lower erythritol or xylitol quantity is also possible.

Appellants further explained on page 19 of the specification, line 17, that, to produce products that have the same sweetness but are completely sugar-free - containing erythritol or xylitol instead of sugar - combination with known sugar substitutes or sweeteners is required in the formula.

Appellants further stated on page 19 of the specification, line 22, that, by using erythritol, reshapeable non-perishable baked goods can now be produced that are also significantly reduced in metabolically available energy. Erythritol can thus act as a low-calorie filler.

Appellants further explained on page 20 of the specification, line 1, that, non-perishable baked goods containing erythritol and/or xylitol are, in addition, suitable as diet products with respect of suitability for diabetics and non- or anticariogenic action.

Appellants further stated on page 20 of the specification, line 6, that, in addition, in the case of exclusive use of

starches, purely white, reshapeable baking-wafer-disc-like wafer products, cones, rolled wafers, deep-drawn or stamped pieces, etc. can now also be produced or, containing corresponding color additives, articles can be fabricated in various colors not impaired by the conventional brown notes of the caramelized sugar.

Appellants further explained on page 20 of the specification, line 17, that, the reshapeable flat or strip-like wafer pieces are, before or immediately after reshaping, accessible to impregnation or coating, by which, for instance, their permeation behavior or sealing behavior can be modified or their taste modified.

Appellants further stated on page 20 of the specification, line 22, that, in addition, the use of erythritol and/or xylitol at concentrations of only a few percent (based on flours and/or starches) likewise gives advantages for the production, since the degree of sweetness of the product can be specifically reduced.

Appellants further explained on page 21 of the specification, line 2, that, in addition, by means of the better plasticizing action, the water concentration required for a defined viscosity can be reduced. As a result, with increasing

concentration of the polyols, less energy is therefore consumed, the baking time required is decreased and thus the output is increased.

Appellants further stated on page 21 of the specification, line 8, that, the quantities given in the examples hereinafter are parts by weight.

Appellants provided, on page 21 of the specification, line 11, EXAMPLE 1: Production of wafer rolls with partial and complete sugar replacement (Dimensions: 9 mm in diameter, 90 mm long). A machine type EWB (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) was used. Wafer rolls of this type have been customarily produced having a sugar level in the range from 50 to over 100% by weight (on the basis of flours and/or starches), preferably 60 - 80% by weight and therefore have an intensively sweet taste, as illustrated by prior art composition of formula No. 1. Formulas 2-8 illustrate the present invention.

Formula No.	1	2	3	4	5	6	7	8
Water	130	125	120	120	120	120	115	110
Wheat flour ¹	100	100	100	100	100	100	100	100
Starch	10	10	5	5	0	5	-	-

Sucrose	70	45	30	20	-	-	-	-
Erythritol ²	-	5	12	18	23	10	26	50
Xylitol ³	-	-	-	-	-	20	-	-
Milk powder	5	5	5	5	5	5	5	5
Baking powder ⁴	0.5	0.5	0.5	0.5	0.5	0.5	1	1
Oil/lecithin 5/2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Rollability	yes	yes	yes	yes	yes ^a	yes	yes	yes ^b
Sticking	no	no	no	no	no	no	no	no
Too soft	no	no	no	no	no	no	no	no ^c
Comments	comp.							

¹ Type 550, Vonwiller, Schwechat, Austria

² Cerestar, Vilvoorde, Belgium

³ Roquette, Lille, France

⁴ Molda 55, Molkerei Dahlenburg AG, Germany

^a impaired rollability

^b tears easily

^c soft strip

comp = comparison

Appellants further explained on page 23 of the specification, line 4, that the products made with the sugar completely

replaced by, for example, 26% by weight of erythritol instead of sugar taste neutral, are not sweet and have a rounded flavor typical of cereals. No rapid oversaturation of taste occurs. The filling with non-sweet confectionery creams gives an attractive product with a rounded flavor.

Appellants provide on page 23 of the specification, line 11, EXAMPLE 2: Production of wafer rolls with partial and complete sugar replacement (Dimensions; 9 mm in diameter, 90 mm long). A machine type EWB (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) was used. Wafer rolls of this type have been customarily produced having a sugar addition in the range from 50 to over 100% by weight (on the basis of flours and/or starches), preferably 60 - 80% by weight and therefore have an intensively sweet taste, as illustrated by formula No. 1 above. Formulas 9-16 illustrate the present invention.

Formula No.	9	10	11	12	13	14	15	16
Water	130	125	120	120	120	120	115	110
Wheat flour ¹	100	100	100	100	100	100	100	100
Starch	10	10	5	5	0	5	-	-
Sucrose	10	45	30	20	-	-	-	-
Erythritol ²	10	-	-	-	-	15	-	-

Xylitol ³	10	5	12	18	23	15	26	50
Milk powder	5	5	5	5	5	5	5	5
Baking powder ⁴	0.5	0.5	0.5	0.5	0.5	0.5	1	1
Oil/lecithin 5/2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Rollability	yes	yes	yes	yes	yes ^a	yes	yes	yes ^b
Sticking	no	no	no	no	no	no	no	no
Too soft	no	no	no	no	no	no	no	no ^c
Comments								

¹ Type 550, Vonwiller, Schwechat, Austria

² Cerestar, Vilvoorde, Belgium

³ Roquette, Lille, France

⁴ Molda 55, Molkerei Dahlenburg AG, Germany

^a impaired rollability

^b tears easily

^c soft strip

Appellants further explained on page 25 of the specification, line 2, that, the products made with the sugar completely replaced by, for example, 26% by weight of xylitol instead of sugar taste less sweet and have a rounded flavor typical of cereals. No rapid oversaturation of taste occurs. The filling

with non-sweet confectionery creams gives an attractive product with a rounded flavor.

Appellants provide, on page 25 of the specification, line 9, EXAMPLE 3: Production of rolled sugar cones with partial and complete replacement of sugar. Appellants further explained on page 25 of the specification, line 12, that baking molds of type TRO (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) are used. The product has the cone shape flat-top, 65 mm long, diameter 28 mm. Such rolled cones customarily have required an addition of sugar of greater than 30 up to 50% by weight (based on flours and/or starches), preferably from 35 to 45% by weight and therefore taste markedly sweet, as illustrated by comparison formula No. 17. Formulas 18-19 and 21-24 illustrate the present invention. Formula 20 is a comparison formula with insufficient polyol, and cannot be rolled.

Formula No.	17	18	19	20	21	22	23	24
Water	120	120	120	120	115	115	115	110
Wheat flour ¹	100	100	100	100	100	100	100	100
Starch	10	10	10	10	10	5	10	10
Sucrose	40	35	20	-	-	-	-	-
Erythritol ²	-	3	10	10	10	13.6	20	30

Xylitol ³	-	-	-	-	10	-	-	-
Sodium bicarbonate	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Lecithin	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Fat	3	3	3	3	3	3	3	3
Rollability	yes	yes	yes	no	yes	yes ^a	yes	yes ^b
Sticking	no	no	no	no	no	no	no	no
Too soft	no	no	no	no	no	no	no	no ^c
Comments	comp.			comp.				

¹ Type 550, Vonwiller, Schwechat, Austria

² Cerestar, Vilvoorde, Belgium

³ Roquette, Lille, France

^a impaired rollability

^b very elastic

^c soft wafer piece

comp = comparison

Appellants further stated on page 27 of the specification, line 4, that, corresponding products with the sugar completely replaced by, for example, 20% by weight of erythritol instead of sugar taste neutral, not sweet and have a rounded flavor typical of cereals. No rapid oversaturation of taste occurs.

The filling with non-sweet confectionery creams gives an attractive product with a rounded flavor.

Appellants further provide, on page 27 of the specification, line 11, EXAMPLE 4: Production of rolled sugar cones with partial and complete replacement of sugar. Baking molds of type TRO (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) are used. The product has the cone shape flat-top, 65 mm long, diameter 28 mm. Such rolled cones customarily have required a level of sugar of greater than 30 up to 50% by weight (based on flours and/or starches), preferably from 35 to 45% by weight and therefore taste markedly sweet, as illustrated by comparison formula No. 17 above. Formulas 25-27 and 29-32 illustrate the present invention. Formula 28 is a comparison formula with insufficient polyol and cannot be rolled.

Formula No.	25	26	27	28	29	30	31	32
Water	85	120	120	120	85	115	115	110
Wheat flour ¹	0	100	100	100	0	100	100	100
Starch	100	10	10	10	100	5	10	10
Sucrose	-	35	20	-	-	-	-	-
Erythritol ²	20	-	-	-	-	-	-	-
Xylitol ³	-	3	10	10	20	13.6	20	30

Sodium bicarbonate	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Lecithin	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Fat	3	3	3	3	3	3	3	3
Rollability	yes	yes	yes	no	yes	yes ^a	yes	yes ^b
Sticking	no	no	no	no	no	no	no	no
Too soft	no	no	no	no	no	no	no	no ^c
Comments	white			Comp.	white			

¹ Type 550, Vonwiller, Schwechat, Austria

² Cerestar, Vilvoorde, Belgium

³ Roquette, Lille, France

^a impaired rollability

^b very elastic

^c soft wafer piece

comp. = comparison

Appellants further explained on page 29 of the specification, line 4, that, corresponding products with the sugar completely replaced by, for example, 20% by weight of xylitol instead of sugar taste neutral, virtually not sweet, and have a rounded flavor typical of cereals. No rapid oversaturation of taste occurs. The filling with non-sweet confectionery creams gives an attractive product with a rounded flavor.

Appellants provided, on page 29 of the specification, line 11, EXAMPLE 5: Production of rolled wafers with partial and complete replacement of sugar. Baking molds of type WRO (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) are used. The rolled wafers are approximately 20 mm in diameter and are 45 mm long. These have customarily required a level of sugar of from greater than 35 up to 60% by weight (based on flours and/or starches), preferably from 40 to 50% by weight and therefore taste markedly sweet, as illustrated by comparison formula No. 33. Formulas 34-40 illustrate the present invention.

Formula No.	33	34	35	36	37	38	39	40
Water	140	120	120	120	120	115	85	110
Wheat flour ¹	100	100	100	100	100	100	0	100
Starch	25	10	10	10	10	5	100	10
Sucrose	50	25	-	-	-	-	-	-
Erythritol ²	-	12	16	23	-	-	25	33
Xylitol ³	-	-	-	-	16	23	-	-
Sodium bicarbonate	0.2	0.2	0.2	0.2	0.2	0.2	-	0.2
Baking powder ⁴	2.5	2.5	2.5	2.5	2.5	2.5	-	2.5
Malt								

extract ⁵	4	4	4	4	4	4	-	4
Lecithin	1	1	1	1	1	1	0.5	1
Fat	8	8	8	8	8	8	2.5	8
Rollability	yes	yes	yes ^a	yes	yes ^a	yes	yes	yes ^b
Sticking	no	no	no	no	no	no	no	no
Too soft	no	no	no	no	no	no	no	no ^c
Comments	comp.						white	

¹ Type 550, Vonwiller, Schwechat, Austria

² Cerestar, Vilvoorde, Belgium

³ Roquette, Lille, France

⁴ Molda 55, Molkerei Dahlenburg AG, Germany

⁵ Liquid malt extract, STAMAG, Vienna, Austria

^a impaired rollability ^b very elastic ^c soft wafer piece

comp. = comparison

Appellants further explained on page 31 of the specification, line 7, that, corresponding products with the sugar completely replaced by, for example, 23% by weight of erythritol or xylitol instead of sugar taste neutral, not sweet, and have a rounded flavor typical of cereals. No rapid oversaturation of taste occurs.

Appellants further provided, on page 31 of the specification, line 12, EXAMPLE 6: Production of deep-drawn, cup-shaped hollow bodies with partial and complete replacement of sugar. In a pilot-plant facility, the products are approximately 65 mm in diameter and are approximately 80 mm high. These customarily have required a level of sugar of from greater than 40 up to 80% by weight (based on flours and/or starches), preferably from 45 to 65% by weight and therefore taste intensively sweet, as illustrated by comparison formula No. 41. Formulas 42-48 illustrate the present invention.

Formula No.	41	42	43	44	45	46	47	48
Water	110	100	100	95	100	95	85	90
Wheat flour ¹	100	100	100	100	100	10 0	0	100
Starch	5	5	5	5	5	5	100	5
Sucrose	60	28	-	-	-	-	-	-
Erythritol ²	-	10	18	26	-	-	25	32
Xylitol ³	-	-	-	-	18	26	-	-
Sodium bicarbonate	0.2	0.2	0.2	0.2	0.2	0. 2	-	0.2
Baking powder ⁴	1	1	1	1	1	1	-	1
Lecithin	1	1	1	1	1	1	0.5	1

Fat	6	6	6	6	6	6	2.5	6
Rollability	yes	yes	yes ^a	yes	yes ^a	yes	yes	yes
Sticking	no	no	no	no	no	no	no	no
Too soft	no	no	no	no	no	no	no	no ^b
Comments	comp.						white	

¹ Type 550, Vonwiller, Schwechat, Austria

² Cerestar, Vilvoorde, Belgium

³ Roquette, Lille, France

⁴ Molda 55, Molkerei Dahlenburg AG, Germany

^a impaired reshapeability

^b soft wafer piece, readily reshapeable

comp. = comparison

Appellants finally stated on page 33 of the specification, line 7, that, corresponding products having the sugar completely replaced by, for example, 26% by weight of erythritol or xylitol instead of sugar, taste neutral, not sweet, and have a rounded flavor typical of cereals. No rapid oversaturation of taste occurs.

References Cited:

US 4,442,132	Kim	April 10, 1984
JP 1312960	Kondo	December 18, 1989

Ground of Rejection to be Reviewed on Appeal:

Whether or not claims 36-59 are obvious over Kim '132 in view of Kondo '960 under 35 U.S.C. §103(a).

Grouping of Claims:

Claims 37-59 stand or fall with claim 36. Claims 36, 46, and 51 are independent. Claims 37-45 depend on claim 36. Claims 47-50 depend on claim 46, claims 52-59 depend on claim 51. Even though three independent claims exist, for purposes of this appeal, the independent claims and their dependent claims should all stand or fall together because all of the independent claims share the same patentable feature.

Argument:

In the second paragraph on page 1 of the final Office action dated May 27, 2005, claims 36-59 were rejected as being obvious over Kim, U.S. Patent No. 4,442,132 (hereinafter, Kim '132) in view of Japanese Patent Application Publication No. JP401312960A to Kondo (hereinafter, Kondo '960) under 35 U.S.C. § 103(a). As will be explained below, it is believed

that the claims were patentable over the cited art in their previously presented form and, therefore, the claims were not further amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 36 calls for, *inter alia*, a baking mixture having the following features:

flours and/or starches, the proportion of flours and/or starches being at least 63.8 percent by weight of said mixture excluding water, and

a plasticizing amount of a plasticizing agent selected from the group consisting of erythritol, xylitol, mixtures of erythritol and xylitol, mixtures of erythritol and sugar, mixtures of xylitol and sugar, and mixtures of erythritol, xylitol, and sugar. (Emphasis added by Applicants.)

Applicants have distilled the Examiner's arguments from the final Office action dated May 27, 2005, into two concise statements. Applicants will address these statements in the response. The arguments were as follows:

- "None of the claims specifically claim a flour/starch content that differs from Kondo." (Page 1, lines 18-19)
- "Applicant has not established criticality to the amounts claimed." (Page 2, line 14)

To address these comments, the remainder of the response will focus on two discussions:

- Examination of the flour and/or starch proportions in the Kim '132 and Kondo '960
- A more detailed explanation of what happens if the products according to the invention have flour and/or starch proportions outside the claimed limits (i.e. criticality of the claimed range).

Examination of the flour and/or starch proportions in Kim '132 and Kondo '960:

A translation of Kondo '960 teaches two examples.

Example 1 teaches a recipe for sponge cake. The flour and/or starch percentages that are taught are 32.6% and 32.8%. In contrast, the baking mixture of the instant application calls for a minimum flour and/or starch content of 63.8%

Example 2 teaches a cookie. The flour and/or starch percentage is 42.9% and 45.0%. In contrast, the baking mixture of the instant application calls for a minimum flour and/or starch content of 63.8%. Furthermore, Example 2 teaches to include 17 parts of fat.

Applicants are convinced that the examples taught by Kondo '960 will never work in any of the manufacturing equipment that they have used while practicing the invention of the instant application.

In addition, with regard to Example 1 (the sponge cake), the level of sweeteners (polyol plus sugar) is so high that no processable intermediate product would be made.

With regard to Example 2 (the cookie composition), both the level of sweeteners (polyol plus sugar) and the fat level in the recipe far exceed the usual range for manufacturing hot heat-deformable crunchy wafer products. From their experience, Applicants have discovered that, for hot heat-deformable crunch wafer products, the fat level must be far less than 10%.

Kim '132 teaches that the flour and starch proportions are even much lower, even if all of the flour substitutes (as according to claim 3 of Kim '132) are included within the "flour and/or starch proportions of all ingredients except water":

Example No.	Flour plus flour substitutes (%)
Example 1	17.9
Example 2	3.0
Example 3	22.0

The teachings of Kondo '960 and Kim '132 involve sweetener-replaced cakes and cookies. In contrast, the invention of the instant application involves hot heat-deformable products; see the examples in the specification for manufacturing crunchy wafers such as wafer rolls (i.e. wafer sticks and wafer flutes), sugar wafer cones, deep-formed wafer bowls, and wafer sugar rolls.

Effects on the Products According To the Invention If the
Flours and/Or Starch Proportions Are Below the Claimed Limit:

The effects on the products according to the invention can be explained through the example of wafer rolls (i.e. wafer flutes) with sugar replacement. Examples 1-16 of the instant application were altered to the levels of starch and/or sugar suggested by the prior art and even lower levels.

For Examples 8 and 16, which are at the lower flour and/or starches proportion limit claimed (i.e. 63.82%), the product already has a remark "c", which indicates that the intermediate wafer strap after baking is "soft". If the flours and/or starches proportion were further lowered for example to 64.01%, the resulting product no longer has sufficient manufacturing stability. Due to the increased softness of the freshly baked and still hot wafer band, the tearing force

needed to release that wafer band from the baking surface will frequently cause rupturing of the wafer band.

The claimed limit of 63.8% for these examples also clearly demonstrates the unexpected additional "plasticizing" effect of using the polyols erythritol and xylitol. Without replacing the sucrose, the "flours and/or starch proportions" must be much lower compared to the recipes according to the invention. Example 1, which was added for comparison, is a conventional wafer product, just with sucrose and without any polyol addition. That comparison example has a flour and/or starch proportion of merely 59.08%.

Accordingly, the same negative "softness effect" applies to the other wafer product types disclosed in the instant application if the flour and/or starch proportion falls below the lower limits given in the respective group of examples.

Clearly, Kim '132 in view of Kondo '960 does not show a baking mixture having flours and/or starches of at least 63.8 percent by weight as recited in claim 36 of the instant application.

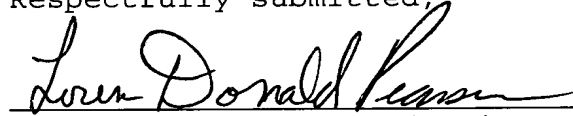
It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 36. Claim 36 is,

therefore, believed to be patentable over the art. The remaining claims are believed to be patentable as well because they all are ultimately dependent on claim 36 or contain similar patentable features.

Prayer for Relief:

In view of the foregoing, the Board is requested to reverse the Examiner's rejection of claims 36-59 and allow the claims.

Respectfully submitted,



Loren Donald Pearson (Registration No. 42,987)

LDP/av

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Claims Appendix:

36. A baking mixture for baking non-perishable baked goods, comprising flours and/or starches, the proportion of flours and/or starches being at least 63.8 per cent by weight of said mixture excluding water, and a plasticizing amount of a plasticizing agent selected from the group consisting of erythritol, xylitol, mixtures of erythritol and xylitol, mixtures of erythritol and sugar, mixtures of xylitol and sugar, and mixtures of erythritol, xylitol, and sugar.

37. The baking mixture according to claim 36, wherein the baking mixture is baked to hot heat-deformable baked articles being mechanically deformed in their hot plastic state and solidified in the obtained shape when cooling to the baked goods.

38. The baking mixture according to claim 37, wherein said articles are mechanically deformed into rolls and solidified to wafer rolls, and the amount of erythritol and/or xylitol is in the range from 15-55% by weight, based on the total of flour and starch.

39. The baking mixture according to claim 37, wherein said articles are mechanically deformed into rolled cones and solidified to rolled wafer cones, and the amount of

erythritol and/or xylitol is in the range from 12 to 35% by weight, based on the total of flour and starch.

40. The baking mixture according to claim 37, wherein said articles are mechanically deformed into deep-drawn shaped bodies and solidified to deep-drawn shaped bodies, and the amount of erythritol and/or xylitol is in the range from 15 to 55% by weight, based on the total of flour and starch.

41. The baking mixture according to claim 36, wherein the baking mixture is free of sugar and the plasticizing amount of erythritol and/or xylitol is in the range from 12 to 55% by weight, based on the total of flour and starch.

42. The baking mixture according to claim 41, wherein the baking mixture is baked to hot heat-deformable baked articles being mechanically deformed in their hot plastic state and solidified in the obtained shape when cooling to the baked goods.

43. The baking mixture according to claim 42, wherein said articles are mechanically deformed into rolls and solidified to wafer rolls, and the amount of erythritol and/or xylitol is in the range from 20 to 55% by weight, based on the total of flour and starch.

44. The baking mixture according to claim 42, wherein said articles are mechanically deformed into rolled cones and solidified into rolled wafer cones, and the amount of erythritol and/or xylitol is from 12 to 35% by weight, based on the total of flour and starch.

45. The baking mixture according to claim 42, wherein said articles are mechanically deformed into deep-drawn shaped bodies and solidified into deep-drawn shaped bodies, and the amount of erythritol and/or xylitol is from 15 to 55% by weight, based on the total of flour and starch.

46. A baking mixture for baking non-perishable baked goods being heat-deformable at an elevated temperature and characterized by a brittle and crispy texture at room temperature, a glass transition temperature above room temperature, said baking mixture comprising:

a) flours and/or starches, the proportion of flours and/or starches being at least 63.8 per cent by weight of said mixture excluding water,

b) an effective plasticizing amount of at least one plasticizing agent selected from the group consisting of at

least one aliphatic polyol having four to five carbon atoms and an alcoholic hydroxyl group linked to each carbon atom, and mixtures of said at least one aliphatic polyol and sugar, wherein the quantity of sugar is in the range from 0 - 63.1% by weight based on the total of flour and starch, and

(c) water in the range from 70 - 150% by weight based on the total of flour and starch.

47. The baking mixture according to claim 46, wherein the baking mixture is free of sugar.

48. The baking mixture according to claim 46, wherein said aliphatic polyol is selected from the group consisting of erythritol and xylitol.

49. The baking mixture according to claim 48, wherein the weight per cent of said polyol is in the range from 12 to 55% based on the total of flour and starch.

50. The baking mixture according to claim 46, wherein the amount of sugar is in the range from 20 to 45% by weight, based on the total of flour and starch, and the amount of said polyol is in the range from 5 to 18% by weight, based on the total of flour and starch.

51. Non-perishable baked goods being heat-deformable at an elevated temperature and characterized by a brittle and crispy texture at room temperature, said baked goods comprising:

(a) flours and/or starches, the proportion of flours and/or starches being at least 63.8 per cent by weight of said mixture excluding water,

(b) an effective plasticizing amount of at least one plasticizing agent selected from the group consisting of at least one aliphatic polyol having four to five carbon atoms and an alcoholic hydroxyl group linked to each carbon atom, and mixtures of said at least one aliphatic polyol and sugar, wherein the quantity of sugar is in the range from 0 - 63.1% by weight, based on the total of flour and starch, and

(c) water in an amount not exceeding 10% by weight, based on the total of flour and starch,

52. The baked goods according to claim 51, wherein the amount of water does not exceed 3%.

53. The baked goods according to claim 51, wherein the baking mixture is free of sugar.

54. The baked goods according to claim 51, wherein said polyol is selected from the group consisting of erythritol and xylitol.

55. The baked goods according to claim 53, wherein the amount of said polyol is in the range from 12 to 55% by weight based on the total of flour and starch.

56. The baked goods according to claim 53, wherein the amount of sugar is in the range from 20 to 45% by weight based on the total of flour and starch, and the amount of said polyol is in the range from 5 to 18% by weight based on the total of flour and starch.

57. The baked goods according to claim 53 having a neutral taste.

58. The baked goods according to claim 53 selected from the group consisting of wafer rolls, rolled wafer cones, rolled wafers, and deep-drawn shaped bodies.

59. The baked goods according to claim 51 made from starches without flour.

Evidence Appendix:

EXHIBIT A is a Declaration of Karl Tiefenbacher according to
37 CFR 1.132.

Related Proceedings Appendix:

Since there are no prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal, no copies of decision rendered by a court or the Board are available.

EXHIBIT AIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applic. No.: 09/768,394 Confirmation No: 1357
Applicant : Franz Haas et al.
Filed : January 24, 2001
Art Unit : 1761
Examiner : Leslie Wong

Docket No. : WEB-19967

Customer No.: 24131

DECLARATION OF KARL TIEFENBACHER ACCORDING TO 37 CFR 1.132

Hon. Commissioner for Patents
P.O. Box 1459
Alexandria, VA 22313-1450

S i r :

In order to assist in the prosecution of this application and the traversal of the rejection of the claims by the Examiner, I, Karl Tiefenbacher do hereby declare as follows:

INTRODUCTION

1. I am a citizen of Austria, and am one of the inventors who with Franz Haas and Johann Haas made the invention of this application.
2. I am trained in chemistry and food technology specializing in bakery technology. I received the degrees of PhD at the University of Vienna (Austria) in 1983. From 1975 - 1988 I

was employed at the "Research Institute of the Austrian Food Industry". Since 1989 I am employed as Scientific Director R&D for the Franz Haas Group.

3. I am the inventor or a co-inventor of US Patents 6,187,363, 6,146,573, 5,711,908, 5,576,049, and 5,376,320 among others.
4. I have read the specification and claims of this application and the Office Action dated September 3, 2004 in which claims 36-59 were rejected as unpatentable over Kim patent 4,442,192 and Kondo abstract of Japanese specification 0131 312960-A. A detailed analysis of the references together with arguments explaining why the present claims are believed to define subject matter that is not taught or suggested by the references is being submitted separately. Here, I propose to supplement that submission with a brief discussion of the importance of plasticization in the production of the kind of baking mixtures and baked goods of concern, and to provide evidence that the claimed baking mixtures and baked products differ qualitatively and quantitatively from the products of the prior art while satisfying commercial requirements for processing and handling conditions as well as meeting consumer expectations of product consistency and taste.

THE CONTRIBUTION OF PLASTICIZATION TO THE BAKING PROCESS

As stated in the specification at page 8, line 3, to page 9 line 2, page 16, lines 4-20 and in the working examples, and claimed in independent claims 36, 46, and 51, the present invention provides a baking mixture such as batter or dough for baking particular kinds of non-perishable baked goods made

from flours and/or starches and having certain combinations of physical properties that those skilled in the art were not previously able to achieve.

The particular non-perishable baked goods under consideration are those that are shaped in a plastic condition when still hot from the baking process or when reheated to return to plastic condition, for example by a wrapping, rolling, pressing, stamping, embossing, bending, folding or deep drawing operation to afford the desired crispy-brittle shaped product. Successful accomplishment of each of these operations, in turn, has hitherto required the use of baking mixtures from a limited range of compositions. Baking mixtures of other compositions are unsuitable for commercial manufacture, wasteful in operation, or fail entirely to produce the desired result.

The manufacture of the particular baked goods under consideration proceeds in three steps:

- (a) first, a baking step produces a baked substantially planar intermediate product capable of being reshaped while hot and not very stable in form
- (b) next, the intermediate product is mechanically reshaped into a different three-dimensional form
- (c) finally, the reshaped intermediate is cooled so that it retains its new shape while giving up its plastic reshapability and solidifies to a crispy-brittle baked product.

Hitherto, such processes have worked only with baking mixtures having a particularly high content of sugar. Water present in the baking mixture acts as plasticizer but is volatilized away during the baking step (see specification at page 1-2). Hence, only the finely dispersed molten sugar resulting from the baking step plasticizes the baked product to impart the essential ability to be reshaped in the second step. This ability to be reshaped is absent without the high content of finely dispersed molten sugar in the baked product. This high sugar content represents a plasticizing agent activated by the heat of the baking process and effective only while hot, so that on cooling the mechanically reshaped intermediate the plasticizing effect disappears as the finely dispersed molten sugar solidifies to a glass or crystallizes and the product is fixed in its desired new shape.

PLASTICIZATION BY SUGAR AS A FUNCTION OF SUGAR LEVEL IN THE MIXTURE

Several disadvantages are associated with the use of unshaped baking mixtures with high sugar content as plasticizing agent for the baked product resulting from the baking process.

With baking mixtures with only a few per cent sugar content, there is the danger that the resulting baked product is very sticky at the end of the baking process and hence does not completely detach from the baking surfaces when the mold is opened, so that the baked product adhering to the baking surfaces is damaged upon opening the mold.

In the usual baking molds for wafers, in which flat wafer sheets, wafer cones, flat or deep wafer cups, and flat or deep

wafer plates receive their final shapes, there are therefore used only sugar-free baking mixtures or baking mixtures with a very low sugar content.

Even with a very low sugar content in the baking mixture it is necessary to use a special anti-adhesion stratum on the baking surfaces or to have specific provisions in the recipe in order to assure that the baked product of the baking process adhering to the baking surfaces of the mold detaches and is not distorted or even destroyed.

With the appreciably higher sugar content in the baking mixture that affords a plasticizing agent when hot, the baked intermediate made from this mixture is very sticky on top and on the bottom. It must therefore be mechanically removed from the baking surface on which it was made and to which it adheres strongly. Hence production of such sticky baked products is only possible in special baking machines, in which the baking surfaces on which the sticky baked products have been made are freely accessible after the baking operation to flat mechanically acting take-off knives etc..

The particular non-perishable baked goods specified above are therefore produced in specialized baking machines from baking mixtures having a very high sugar content effective as plasticizing agent when hot, such as individual flat wafer sheets or continuous flat wafer belts, to be shaped or mechanically reshaped after baking while in a warm, plastic condition by wrapping, rolling, pressing, stamping, embossing, bending, folding or deep drawing to afford mini-rolls, cones, flat or deep plates, flat or deep cups etc..

The products of mechanically reshaping wafer sheets and wafer

belts in a warm plastic condition are allowed to cool to room temperature in their new 3-dimensional shape to eliminate the plasticizing effect of the finely dispersed sugar and the reshapingability of the goods, and allow the latter to solidify to a crispy-brittle structure that retains its shape.

The reshapeable flat or strip-like wafer pieces are, before or immediately after reshaping, accessible to impregnation or coating, by which, for instance, their permeation behavior or sealing behavior can be modified or their taste modified.

PLASTICIZING EFFECT OF ERYTHRITOL AND XYLITOL IN BAKING MIXTURES

As found according to this invention, in the baking mixtures of interest erythritol and xylitol are more efficient plasticizers than sugar, i.e. more plasticizing effect by a given weight concentration of erythritol and/or xylitol than the plasticizing effect of the same weight concentration of sugar. Hence, the use of erythritol and/or xylitol at concentrations of only a few percent (based on flours and/or starches) unexpectedly gives advantages for the production, since the degree of sweetness of the product can be specifically reduced.

In addition, by means of the better plasticizing action of erythritol and/or xylitol, the water concentration required for a defined viscosity can be reduced. As a result, with increasing concentration of the polyols, less energy is therefore consumed, the baking time required is decreased and thus the output is increased.

In my experience of the production of wafer rolls 9 mm in diameter and 90 mm long using a machine type EWB (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) such wafer rolls have been customarily produced having a sugar level in the range from 50 to over 100% by weight (calculated on the basis of flours and/or starches), preferably 60 - 80% by weight and therefore have an intensively sweet taste.

Partial replacement of sugar according to the invention by reduced levels of erythritol as in 45, 30 and 20 parts by weight of sugar with 5, 12, and 18 parts of erythritol respectively has afforded fully acceptable commercial products with satisfactory handling and processing properties in production and brittle crispy consistency and taste satisfying consumers' wishes.

Complete replacement of sugar according to the invention by reduced levels of erythritol and/or xylitol, as with 26 parts by weight of erythritol or with a combination of 10 parts by weight of erythritol and 20 parts by weight of xylitol, has afforded fully acceptable commercial products having satisfactory handling and processing properties in production and brittle crispy consistency and tasting neutral, not sweet, with a rounded flavor typical of cereals.

I have found that complete replacement of sugar according to the invention by reduced levels of erythritol and/or xylitol is effective over a range of proportions of erythritol and/or xylitol calculated as percent of flour and/or starch, bounded at the lower end of the range by insufficient plasticization of too little is used and at the upper end of the range by excessive plasticization giving softer products than desired.

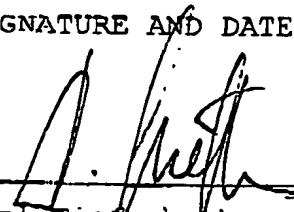
Thus recipes including 23 parts by weight and 50 parts by weight of erythritol respectively are still within but close to the boundaries of the effective range.

Similarly, I have found production of rolled wafers approximately 20 mm in diameter and 45 mm long in baking molds of type TRO (Franz Haas Waffelmaschinen Industrie AG, Vienna, Austria) with partial and complete replacement of sugar by erythritol and/or xylitol, production of rolled sugar cones with partial and complete replacement of sugar by erythritol and/or xylitol, and production of deep-drawn, cup-shaped hollow bodies with partial and complete replacement of sugar by erythritol and/or xylitol feasible according to this invention with commercially acceptable results.

SUMMARY AND ACKNOWLEDGMENT

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE AND DATE SIGNED


Karl Tiefenbacher

Date: Nov. 30, 2004